IT-314 Software Engineering

Lab - 06 Modeling Class Diagram and Activity Diagram (Point of Sale System)

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Aim:

- Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.
- Identify Entity/Boundary Control Objects
- Develop Sequence Diagrams
- Develop Analysis Domain Models
- Develop activity diagrams for "Process Sale" and "Handle Return" use cases.

For Process sell :

Actor:

- Cashier

Preconditions:

- The POS system is operational, with all necessary components working correctly.
- The cashier is logged into the system with the appropriate permissions to process transactions.

Postconditions:

- The sale is successfully recorded in the system's transaction history.
- The inventory is updated to reflect the items sold.
- A receipt is printed and provided to the customer, ensuring they have proof of purchase.

Basic Flow:

1. A customer approaches the POS with items they wish to purchase.
2. The cashier begins a new sale transaction by selecting the option on the POS system.
3. For each item in the customer's cart:

   a. The cashier scans the item's barcode using the scanner.

b. The system retrieves detailed information about the item, including the name, price, and any applicable discounts from the catalogue.

c. The system updates the inventory to reflect that the item has been sold. d. The system adds the item to the current transaction, updating the cart total.

4. After all items are scanned, the system calculates the total amount due, including taxes and discounts, and displays it on the screen for the cashier and customer to see.
5. The customer selects their preferred payment method, which can be cash, credit card, or check.
6. The cashier processes the payment through the Payment Processor, ensuring that the transaction is completed securely.
7. The system records the sale details, including item information and payment confirmation, in the sales database.
8. The system prints a detailed receipt, including a list of purchased items, total cost, and payment method.
9. The cashier hands the receipt and purchased items to the customer, thanking them for their business.

Alternative Flows:

3b. If the item is not found in the catalogue:

1. The cashier can manually enter the item details, including the name and price.

2. The system confirms that the item has been added to the transaction.

4a. If the customer has a gift coupon:

3. The cashier applies the coupon during the transaction.
4. The system recalculates the total amount, applying the coupon discount.

5a. If the customer decides to back out of the purchase:

5. The cashier cancels the transaction by selecting the cancel option on the POS system.
6. The system reverts any inventory adjustments made during the transaction process.

6a. If payment processing encounters an error:

7. The system alerts the cashier about the payment failure.
8. The cashier kindly informs the customer and requests an alternative payment method, such as another card or cash.

7. If the customer requests a detailed receipt:

9. The cashier can select the option to print an itemised receipt.
10. The system generates and prints the detailed receipt upon the customer's request.

For Handle Return :

Actor:

- Cashier

Preconditions:

- The POS system is fully operational and equipped for handling returns.
- The cashier has logged into the system with the necessary access rights.
- The customer is present with items to return and has the original purchase receipt.

Postconditions:

- The return transaction is accurately recorded in the system's database.
- The inventory reflects the returned items, ensuring stock accuracy.
- The refund is successfully processed in accordance with the original payment method.
- A detailed return receipt is printed and handed to the customer for their records.

Basic Flow:

1. A customer approaches the POS, carrying items they wish to return, along with the original receipt.
2. The cashier initiates a new return transaction by selecting the appropriate option on the POS interface.
3. The cashier scans the barcodes of the items or manually inputs their details into the system.
4. The system checks the items' eligibility for return, ensuring they fall within the store's return policy timeframe.
5. The system calculates the total refund amount based on the items being returned, considering any applicable discounts or fees.
6. The cashier confirms the reason for the return with the customer to ensure clarity and proper record-keeping.
7. The system updates the inventory to reflect the return, marking the items as available for resale.
8. The cashier processes the refund through the original payment method used for the purchase, ensuring a smooth transaction.
9. The system logs the return details, including item descriptions, the refund amount, and the transaction date.
10. The system generates a return receipt that includes a summary of the returned items and the refund amount.
11. The cashier presents the return receipt to the customer, thanking them for their patience and cooperation during the process.

Alternative Flows:

4a. If the items do not qualify for return:

1. The system alerts the cashier that the items are ineligible based on store policy.
2. The cashier explains the situation to the customer, detailing the reasons for the denial.
3. The return process is halted, and the cashier offers alternatives, such as exchanges or store credit.

5a. If the items appear damaged or used:

4. The cashier examines the condition of the items being returned.
5. Based on the inspection, the system may adjust the refund amount or reject the return entirely, depending on store guidelines.

8a. If the original payment method cannot be processed:

6. The cashier opts for an alternative refund method, like issuing store credit or refunding via a different card.
7. The system processes the refund using the alternative option selected, ensuring the customer is informed.

9a. If the customer wishes to return additional items not listed on the original receipt:

8. The cashier cross-verifies the customer's claim with the original purchase receipt.

9. The system evaluates whether the additional items can be returned, based on eligibility and store policies.

10a. If the customer requests a copy of their return receipt:

10. The cashier can select an option in the system to reprint the return receipt.
11. The system prints a duplicate receipt for the customer's records upon request.

Identify Entity/Boundary/Control Objects :

Entity Objects

1. Transaction
2. Product
3. Payment Method
4. Customer
5. Cashier Staff
6. Inventory
7. Discount Coupon
8. Return Transaction

Boundary Objects

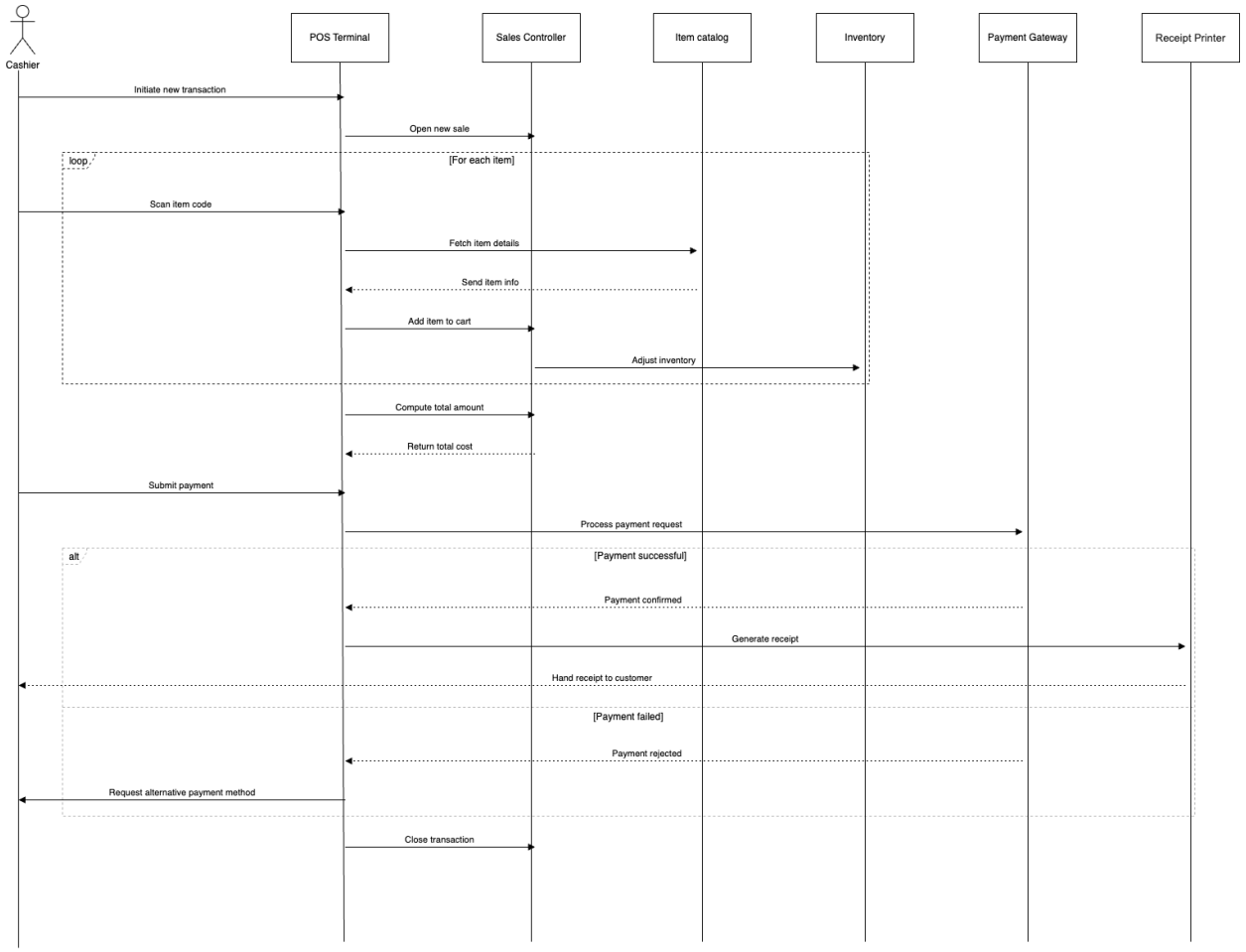
1. POS System Interface
2. Item Scanner
3. Receipt Generator
4. Payment Processing Terminal

Control Objects

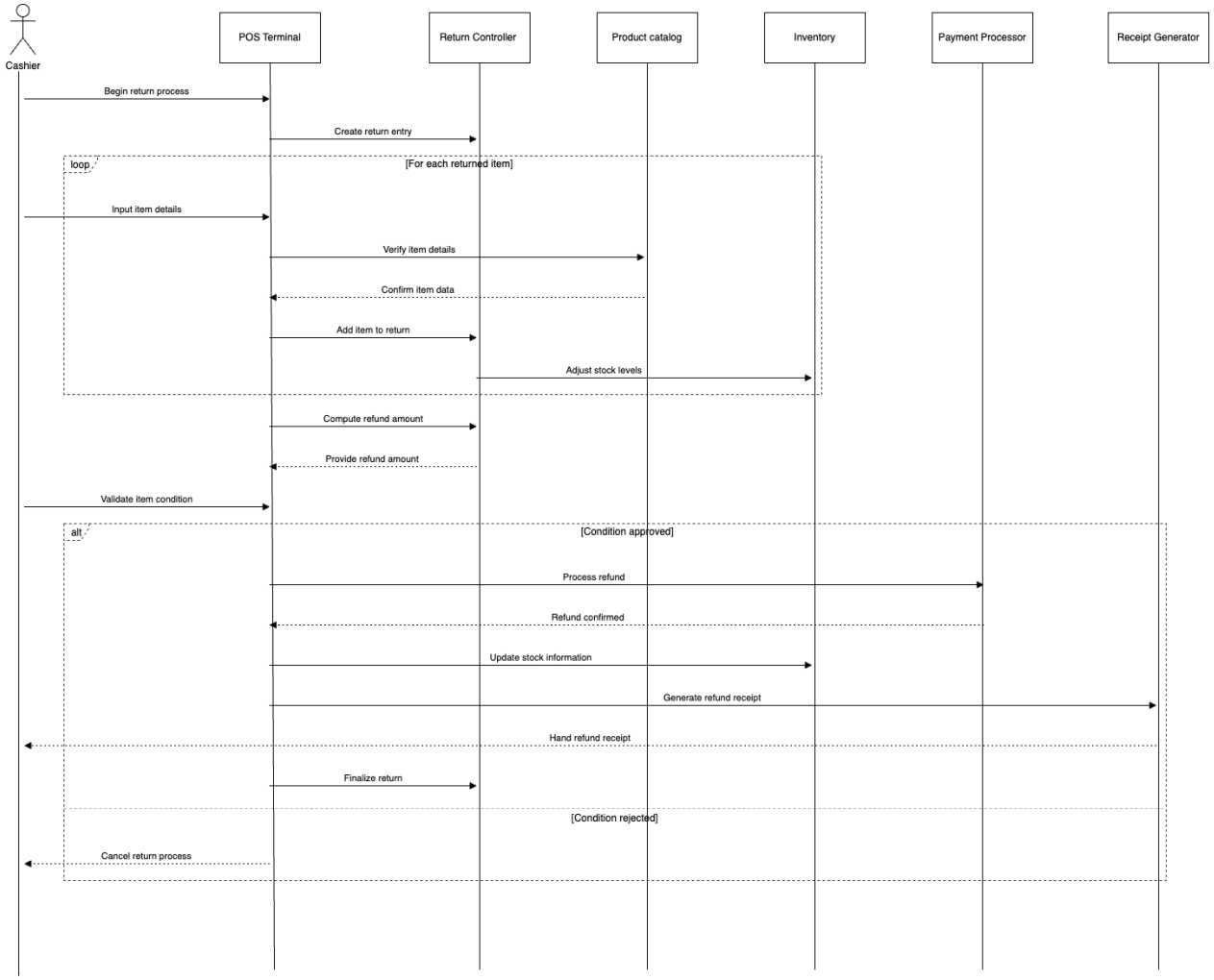
1. Transaction Manager
2. Inventory Manager
3. Payment Handler
4. Product Catalog Manager
5. Return Processing Manager

Sequence Diagram :

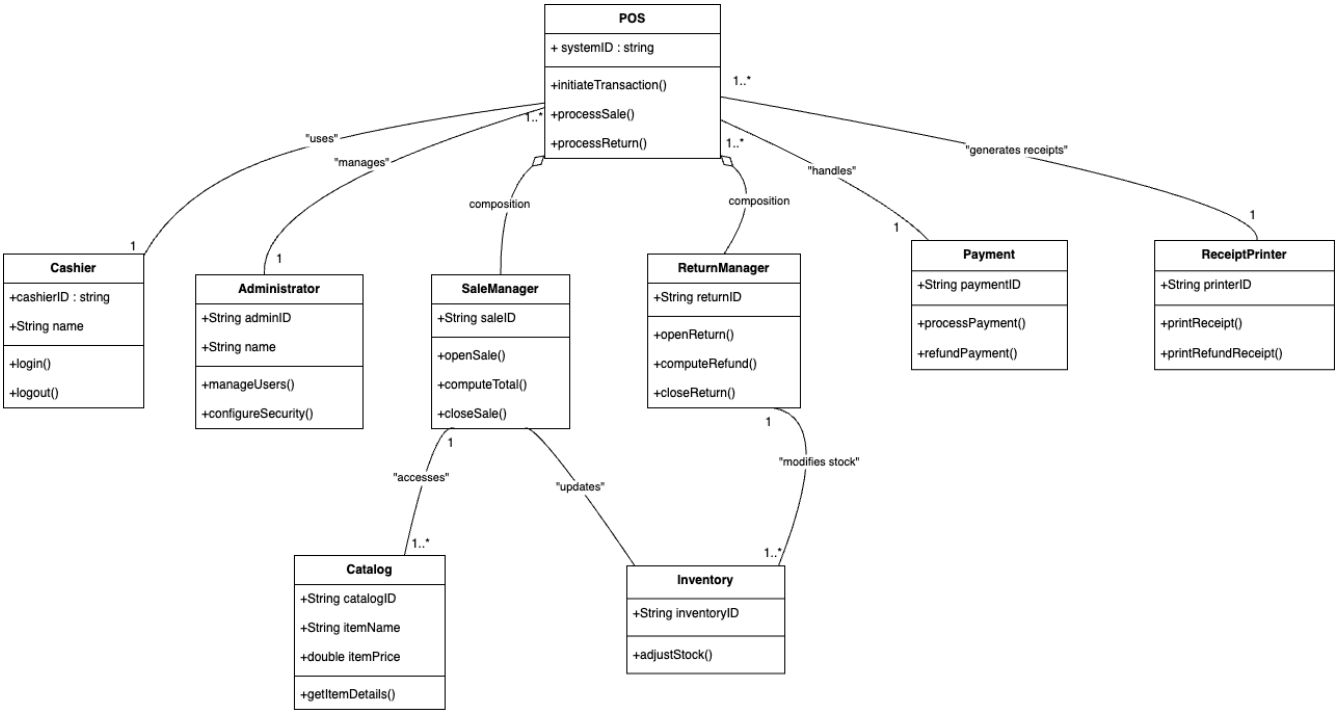
For Process Sell :



For Handle Return :

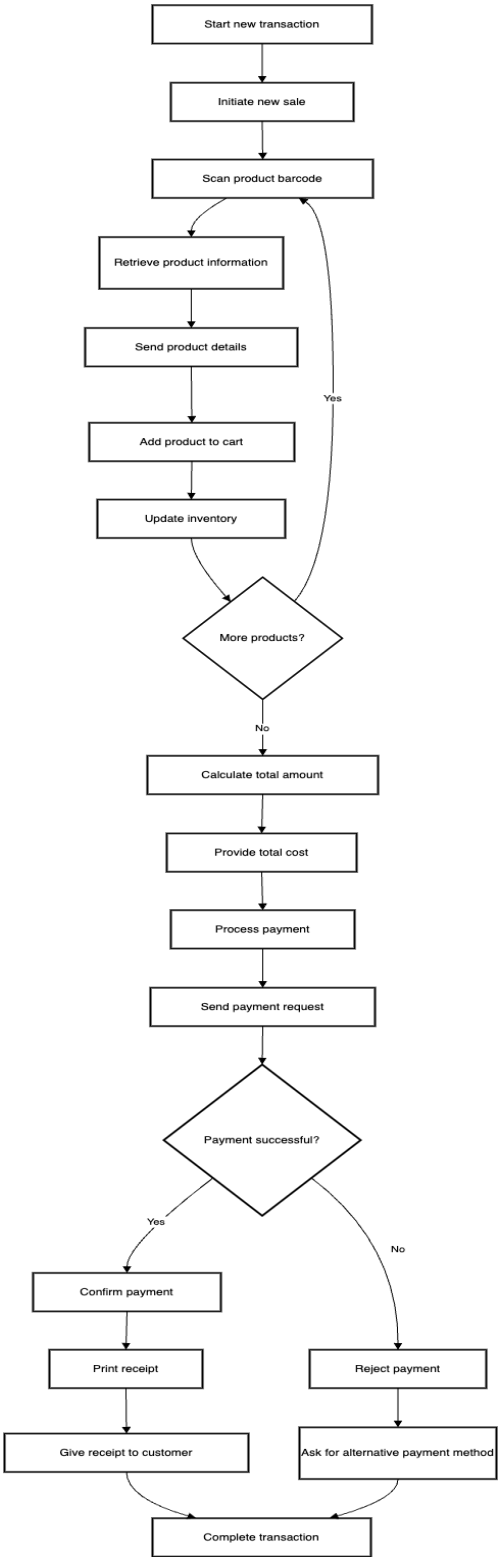


Develop Analysis Domain Model :



Develop Activity Diagram :

For Process Sell :



For Handle sell :